Draft
11/14/01

Columbia River TMDL
Discussion of Grand Coulee Temperature Management
Grand Coulee, WA
November 5, 2001

- Overview of Columbia River Temperature TMDL
  - EPA is issuing the Temperature TMDL for Oregon, Washington, and for Tribal Waters. Idaho will issue the Temperature TMDL for the Idaho portion of the Snake.
  - EPA has conducted public meetings on the Temperature model RBM-10, and the temperature problem assessment. The next set of meetings will cover the calculation of waste loads and waste load allocations and will likely be held in February of 2002.
  - The draft Temperature TMDL will be issued by March 2002, this includes the Lake Roosevelt portion of the Temp TMDL.
- Working with Canada
  - EPA and the states are working with Canada through the Transboundary Gas Group that meets twice a year to outline options for dealing with the Canadian contributions of gas and temperature.
- Total Dissolved Gas TMDL (Washington)
  - The lower Columbia TMDL will be completed by Spring 2002, the mid Columbia will be completed by summer 2002.
    - Colville and Spokane Tribes voiced concern over the order in which the TMDLs are being completed and questioned why Columbia being addressed from the mouth of the river up. Washington responded that this is due to pressure being applied by the courts to complete the lower Columbia TDG TMDL by the end of 2001, or soon thereafter.
- New Regional Temperature Guidance
  - Provides guidance to the states seeking to change WQS. EPA will likely approve standards formulated according to these guidelines. The adoption of these guidelines does not increase the likelihood of state changes to WQS, and according to Washington, even though changes are in the works, it will be quite some time before they are even submitted for approval. Therefore, the objective of the Columbia River TMDL will be to meet current standards.
- Overview of the uses and how the dam operations are governed
  - Grand Coulee Dam was built as a key feature of the Columbia Basin Project. Primary objective irrigation water. Provides irrigation to 213 million acres of farm land. 2.5 million acre feet of water allotted for irrigation annually. 7.5 maf of storage available.
  - Power production. Grand Coulee provides 21 million megawatt hours of power per year. Most power produced during high demand time (day). Daily average load=2000 megawatts. Megawatt capacity = 6,500.
  - Flood control. Reservoir elevation set to provide flood protection during high flow times. Elevation determined by Corps of Engineers in Portland. After flood season, Bureau and BPA work to keep lake full as possible and to meet ESA

requirements.
    - Recreation. An elevation of 1285 is ideal for recreation and resident fish when held constant. Managers try to keep elevation at 1283 or above.
- Locations and structures in the dam from which water can be drawn for spill/power/tourism.
    - Bureau of Reclamation handed out summary of outlets from Grand Coulee dam and its power plant complex.
        - At just over full pool elevation of 1290 feet
            - Spillway max = 1,000,000 cfs (total)
            - Outlet works max = 191,920 cfs (total)
            - Right powerplant = 50,000 cfs (generating), 4,500 cfs (not generating)
            - Left powerplant = same as right
            - Third Powerplant = 180,000 cfs (generating) and 18,000 cfs (not generating)
            - Grand Coulee Pump-generating plant, with elevation being intake centerline = 19,200 cfs (total)
- Goals/constraints that affect current operations
    - December 2000 Biological Opinion
    - Vernita Bar (below Priest Rapids Dam) is salmon spawning ground. To protect salmon habitat, 55,000 cfs is minimum in fall and maximum in spring.
    - Grand Coulee is the last storage facility on the river. Water released from Grand Coulee must then be coordinated by each of the dams on the lower river.
    - Dam must operate within the parameters of power demand and flood control.
        - BiOp requires flood control elevation be achieved by April 10, and 1280 or above by 12th of July
        - Min elevation is 1208 ft. Flood control elevations set by Corps based on snow pack, moisture content in basin.
    - Bureau prefers not to use spillway and outlet works. These options provide no power and produce total dissolved gas.
- FDR temperature modeling efforts to date
    - EPA provided a power point presentation on CE-QUAL-W2, a 2D ecosystem model being used to model temperature for Lake Roosevelt
        - Model requirements:
            - Meteorology (used data from Spokane)
            - Tributary and mainstem flows and temperature
            - Reservoir bathymetry
            - Reservoir operation
        - Model simulations at times fell below observed, and the 2D model has not yet proven to be superior to the 1D RBM-10 model. Presentation available at http://www.epa.gov/r10earth/columbiamaintemtmdl.htm.
        - Data suggestions:
            - Tribes questioned bathymetry data. Data used dated from 1960s and it could have changed.

- Gary Passmore suggested looking at Bureau daily data for climate. There is a microclimate around the lake (heat sink) and can difference of 20 degrees between Grand Coulee and Spokane. He has 10 years worth of data in hard copy
- Keith Underwood has taken at depth temperatures for many years in FDR
- Dave Zimmer may have some temperature data
- Keith Underwood reported that there are 3 temperature monitors in the Spokane River.
- Fish farms 12 miles downstream may have temp data
- John Beamon may have data from Rufus Woods study (Patti Stone may also have this data)

- Issues surrounding water use at Grand Coulee
  - Having reservoir at elevation below 1280 in summer is detrimental for resident fish. Dewaters spawning grounds, stresses zooplankton, creates recreational issues, artifact hunting becomes an issue on exposed tribal lands.
  - Pulling cool water out of Coulee in late August/early September can cause FDR to go isothermal. This would be lethal for resident fish like rainbow trout and kokanee.
  - Constant lake level is preferred for resident fish.
  - Colville Tribe would strenuously object to using FDR to cool downstream, and feel it is premature to talk solutions as we do not yet have a full understanding of the system.
  - No such thing as "normal" with FDR. Conditions are all over the map.
  - Concern that Coulee is in a politically uninfluential area and will ultimately be overridden by west coast interests.
- Suggestions for improving downstream temp
  - Fill reservoir earlier in the year. This may lower the reservoir temperature making more cool water available for downstream use.
  - Reverse the return flow from the Columbia Basin Project
  - Only pump warmer water into Banks Lake, again lowering the temp in reservoir.
    - Concern about temperature violations in man made water way
  - Idea of being able to draw from multiple levels into power generation units has been taken off the table. Prohibitively expensive.

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Columbia River TMDL
Discussion of TDG Work Effort for Tribal Waters
Grand Coulee, WA
November 6, 2001

- **Geography Considerations**
  - TMDL covers Columbia River from Canadian border to the mouth of the river at Astoria, WA.
  - Lower Columbia = Confluence with the Snake to Astoria. Mid Columbia = Confluence with Snake to Canadian border
    - Tribal concern over the Lower Columbia TMDL being completed prior to the upstream portions. Court agreements in Oregon driving the lower river to be completed this year.
  - EPA is issuing TMDL for tribal waters and needs to be clear on boundaries.
    - Patti Stone will provide Jannine Jennings with a map of the 5 party agreement between Spokane and Colville tribes, BIA, NPS, & USBR. This outlines tribal boundaries for operation of FDR.
  - FDR is within Spokane and Colville reservation boundaries. North of Kettle Falls is off the reservations, but WA expressed interest in having EPA take the lead on this segment as well.
  - Suggested that Little Falls on the Spokane River be a boundary.
    - EPA would like to coordinate timing of tribal portion with the state TMDL effort, need to know WA schedule for Spokane River above Little Falls. Jannine and Ann will discuss timing.
    - EPA suggested that WA should make Spokane River an out of basin project and address it at same time as the rest of the mid Columbia TMDL.
    - Another option is to engage FERC and try to bring some control to TDG through relicensing.
  - Tribes also see Pend'Oreille River as valid for inclusion in TMDL
- **Tentatively proposed scope and plan for mid Columbia TDG TMDL**
  - Canadian border to Confluence with Snake, including the Okanogan River to high water mark, Pend'Oreille River to high water mark, and the Spokane arm of L. Roosevelt below Little Falls Dam—one TMDL, joint effort between EPA, states and Tribes. Each entity would reserve the right to reject the TMDL.
    - From Chief Joseph Dam to Grand Coulee Dam, Washington and EPA would do work, WA would take the technical lead, and EPA would issue.
    - Above Grand Coulee, EPA would take the technical lead and issue the TMDL.
    - Below Chief Joseph, WA would take the technical lead and will issue.
    - Okanogan River is half tribal and half state, so there would be two issuances – one state and one by EPA.
- **Allocating loads for TDG**
  - Paul Pickett reviewed Washington's plan for determining load allocation
    - Elevation of the dam and spill volume determine the pressure differential (ΔP). Loading allocation will be based on (ΔP). Achieving the prescribed

(ΔP) at specified points of compliance will require both short term (operational) and long term (structural) changes.
        - Washington hopes to meet standards below each dam, thus meeting the standard for the whole river.
    - Other options for allocating TDG loads
        - Can look at pressure differential at tributaries, base of dams, Canadian border, etc, and then prescribe loads to each of these, rather than just dams.
            - Problem with this concept – prescribing loads to entities over which we have no authority or control. Soon beyond scope of this TMDL
        - Strictly operational – don't allow spill to exceed a certain volume.
            - WA uncomfortable with this concept because can't always control spill. High water years may confound TDG control measures.
        - Can look at pressure differential above and below dams
- **What is ultimate goal of TDG TMDL, what is the "rock" we are trying to make?**
    - TDG not to exceed 110% saturation at any time or place.
- **Implementation**
    - State and tribal effort
    - In Idaho, tribes have taken the lead on developing implementation plans for tribal lands.
- **Expectation of Tribes**
    - Spokane tribe minimum expectation: EPA will identify and quantify the loading reductions needed to bring TDG to 110% in the Columbia River, and identify the impact these sources are having on the river.
    - Maximum expectation: All of the above, and include the Spokane River, the Pend'Oreille, and Canada in the TMDL effort. EPA would spearhead a coordination effort to bring down Canadian TDG levels, based upon the research done for this TDG TMDL.
    - GCD and CJD will be brought to 110%
    - Funding to help tribes participate in this process
- **Role of EPA**
    - EPA will develop loading allocations
    - EPA will work with tribes and pursue consultation
        - Tribes agree to participate in monthly coordination meeting if specific times are established for the mid Columbia discussion.
    - Possible funding
        - Tribes should submit proposals to Jannine by 11/30/01
- **Concerns**
    - Uncontrolled boundary condition.
    - Lake needs to be modeled. We don't even know how much gas we're inheriting from Canada.
    - USBR will deal only with gas created at Grand Coulee Dam, not gas that they have inherited from other sources
    - Only gas abatement measures at Chief Joseph Dam

- **Additional considerations**
  - Paul Pickett would like to talk with technical staff and tribal representatives about data needs and who can supply data
  - Paul Pickett would like to discuss monitoring needs with tribes
  - Rick offered to meet with tribes in January regarding loading allocations for temperature.